

### REMARKS/ARGUMENTS

Favorable reconsideration of this application is requested in view of the above amendments and in light of the following remarks and discussion.

Claims 1-26 are pending. No claims are amended or newly added. No new matter is added. In the outstanding Office Action, Claims 1, 7, 9-12, 18, and 20-26 were rejected under 35 U.S.C. § 103(a) as obvious over Flanigan et al. (U.S. Patent No. 6,081,414, herein "Flanigan") in view of Sundar (U.S. Patent Pub. 2001/0016157, herein "Sundar") and Sung et al. (U.S. Patent No. 6,347,990, herein "Sung"). Claims 2, 7, 13, and 18 were rejected under 35 U.S.C. § 103(a) as obvious over Flanigan, Sundar, Sung and further in view of Watanabe et al. (U.S. Patent No. 5,625,526, herein "Watanabe"). Claims 3-5, and 14-16 were rejected under 35 U.S.C. § 103(a) as obvious over Flanigan, Sundar, Sung, and Nagasaki (U.S. Patent No. 6,215,643, herein "Nagasaki"). Claims 6, 8, 17, and 19 were rejected under 35 U.S.C. § 103(a) as obvious over Flanigan, Sundar, Sung, Nagasaki, and Paschen (from F. Paschen published paper (Wied. Ann., 37, 69, 1889), herein "Paschen").

Regarding the rejection of Claims 1, 7, 9-12, 18, and 20-26 as obvious over Flanigan, Sundar, and Sung, that rejection is respectfully traversed by the present response.

Independent Claim 1 recites, in part:

carrying the object to be processed into the vacuum processing chamber, generating plasma to plasma-process the object to be processed, and carrying the object to be processed that has undergone the processing out of the vacuum processing chamber; and

between said processing of the object to be processed and processing of a subsequent object to be processed, circulating the insulating fluid in the flow path while the object to be processed is not in the vacuum processing chamber and no plasma is generated, and controlling pressure in the vacuum processing chamber to a predetermined pressure while supplying inert gas into the vacuum processing chamber.

Accordingly, the object to be processed is placed in the processing chamber and removed from the chamber. Between the processing of the object and a later processing of

another object, the recited method circulates an insulating fluid while the object is not in the processing chamber. The pressure in the chamber is controlled while the inert gas is supplied to the chamber.

As described in the previous response for the previous Office Action, Flanigan is directed to an apparatus for improved biasing and retaining a workpiece in a plasma process chamber comprising a pedestal assembly, block (104) shown in Fig. 2, an electrostatic chuck (105) in the vacuum processing chamber disposed to be in contact with the block and made at least partly of an insulative material. The wafer is transferred to/from the chamber from/to a loadlock, shown in Fig. 1, and is plasma processed. The vacuum in the chamber is controlled for PVD or other processes. In the operation, Flanigan describes only that the wafer (102) is placed on the support surface (103) of the electrostatic chamber, and then, air is drawn out of the chamber (100) via the vacuum pump (128) to create a low pressure environment (i.e., 1 mTorr to 5 Torr), and then, the reactant gas is introduced into the chamber (100) from one of the remote gas sources (130) and (134).<sup>1</sup>

In contrast, the invention recited in Claim 1 is directed to controlling the pressure inside the vacuum processing chamber, e.g., within a range of 10-1000 mTorr by supplying the inert gas into the vacuum processing chamber between one object processing and a subsequent object processing.<sup>2</sup>

Although the pressure environment with a pressure range of 1 mTorr-5 Torr in Flanigan encompasses the pressure environment with a pressure range of 10-1000 mTorr described in the specification, the configuration of the pressure environment in Flanigan is different from the configuration of the pressure environment in the invention recited in Claim 1 because the pressure environment in Flanigan is directed toward **plasma processing** and in contrast, the pressure environment recited in Claim 1 is directed at the **idle state** of the

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<sup>1</sup> Flanigan, col. 7, lines 19-31.

<sup>2</sup> See numbered paragraphs [0045]-[0050] of the specification.

plasma processing between the one object processing and the subsequent object processing. As a result, Flanigan does not teach or suggest the pressure environment of the invention, recited in Claim 1 as is acknowledged in the outstanding Office Action.

Sundar merely describes delivering a purge gas such as argon (Ar) or nitrogen (N<sub>2</sub>) into the **transfer chamber** via the purge gas inlet.

In contrast, the invention recited in Claim 1 is directed to delivering an inert gas such as Ar into **the plasma processing chamber, not to the transfer chamber**. Accordingly, Sundar, does not teach to deliver the inert gas into the plasma processing chamber as recited in Claim 1 and fails to remedy the deficiencies discussed above regarding Flanigan.

Sung teaches only to maintain higher **air** pressure in the processing area than the air pressure in the transfer area (transfer chamber). Sung describes **air** pressure, not inert gas pressure. Also, Sung teaches only to maintain a **higher** pressure in the processing chamber, not a predetermined pressure while supplying inert gas into the processing chamber between the processing of the object to be processed and the processing of the subsequent object to be processed as recited in Claim 1.

Moreover, the outstanding Office Action recognizes that the maintenance of higher pressure in the process chamber in Sung is directed toward eliminating particle flow from the transfer chamber. In other words, the outstanding Office Action recognizes that the combination of Flanigan, Sundar, and Sung cited in the outstanding Office Action is directed toward the eliminating particle flow from the transfer chamber. In contrast, the invention recited in Claim 1 is directed toward suppressing charging of a component in the processing chamber.

Accordingly, Applicants respectfully submit that independent Claim 1 and Claims 7, 9-11, 23, and 24 depending therefrom patentably distinguish over any proper combination of Flanigan, Sundar, and Sung for at least the reasons discussed above.

Independent Claim 12 recites substantially similar features to those discussed above regarding independent Claim 1 and patentably distinguishes over any proper combination of Flanigan, Sundar, and Sung for at least the same reasons as independent Claim 1 does.

Claims 18, 20-22, 25, and 26 depend from independent Claim 12 and patentably distinguish over any proper combination of Flanigan, Sundar, and Sung for at least the same reasons as independent Claim 12 does.

Regarding the rejection of Claims 2, 7, 13, and 18 as obvious over Flanigan, Sundar, Sung and Watanabe, the rejection of dependent Claims 3-5 and 14-16 as obvious over Flanigan, Sundar, Sung, and Nagasaki, and the rejection of dependent Claims 6, 8, 17, and 19 as obvious over Flanigan, Sundar, Sung, and Nagasaki and further in view of Paschen, Applicants respectfully submit that none of these references remedies the deficiencies discussed above regarding Flanigan, Sundar, and Sung.

The outstanding Office Action relies on Watanabe for the feature of an electrostatic chuck system. However, Watanabe is devoid of, between the processing of the object to be processed and the processing of a subsequent object, controlling pressure in the vacuum processing chamber to a predetermined pressure while supplying an inert gas into the vacuum processing chamber as recited in independent Claims 1 and 12. Accordingly, Applicants respectfully submit that dependent Claims 2, 7, 13, and 18 patentably distinguish over any proper combination of Flanigan, Sundar, Sung, and Watanabe for at least the same reasons as independent Claims 1 and 12 do.

The outstanding Office Action relies on Nagasaki for the features of the particular resistivity of the insulative material. However, Nagasaki describes an electrostatic chuck and a method of making the chuck. Nagasaki is unrelated to the specific process recited in independent Claims 1 and 12 and fails to remedy the deficiencies of the above-noted cited references.

Paschen is unrelated to the specific process recited in independent Claims 1 and 12 and fails to remedy the deficiencies of the references discussed above.

For the foregoing reasons, it is respectfully submitted that this application is now in condition for allowance. A Notice of Allowance for Claims 1-26 is earnestly solicited.

Should Examiner Dahimene deem that any further action is necessary to place this application in even better form for allowance, Examiner Dahimene is encouraged to contact Applicants' undersigned representative at the below-listed telephone number.

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